

PUBLIC HEALTH REPORTS

VOL. 49

AUGUST 24, 1934

NO. 34

TENDENCIES IN STANDARDS OF RIVER AND LAKE CLEANLINESS¹

By H. W. STREETER, *Sanitary Engineer, United States Public Health Service*

During recent years a strong trend has developed throughout the entire field of public health and sanitation toward the formulation of standards, both in respect to administrative practice and in relation to methods of technical control. In public health administration, committees thus have been endeavoring to set up standards of organization, budgeting, disease reporting, and efficiency rating. In general sanitation we find numerous examples of a similar tendency, such as the formulation of standards for milk control, for housing and air conditioning, for the sanitation of shellfish areas, and for the quality of public drinking water supplies.

In connection with the general problem of waterways sanitation, the question of standards has occupied the thought of various authorities for many years past. In Great Britain its consideration began as early as 1865, when the first of several legislative acts was passed to permit local authorities to combine to protect watercourses from pollution by sewage. In 1875 these several acts were replaced by the Public Health Act, which was followed by the River Pollution Prevention Acts of 1876 and 1893. Under the former the well-known Mersey and Ribble and West Riding Rivers Boards were organized. In 1898 the second British Royal Commission on Sewage Disposal was appointed, and the subsequent reports of various investigations carried out by this commission have become part of the classic literature of sewage disposal and river sanitation.

Although the congestion of industrial population in Great Britain, together with the smallness and shortness of rivers in that country, caused attention to be directed to stream pollution at a somewhat earlier period than in most other countries, the situation in the north-eastern section of the United States caused the Massachusetts Board of Health to institute, in 1872, a study of sewage disposal and river pollution in that State. This study led to the notable series of investigations at the Lawrence Experiment Station, with which the names of such pioneer leaders as Drown, Sedgwick, Mills, Fuller, Hazen, Phelps, Clark, and others have been indelibly associated. To these

¹ Presented at the meeting of the Illinois Association of Sanitary District Trustees, Waukegan, Ill., June 13, 1934.

men we owe much of the progress which has been made in this country in water and sewage sanitation during the past 30 or 40 years.

The earlier concepts relative to standards of waterways pollution were shaped very materially by the conditions prevailing both in the British Isles and in New England at that time. In both instances the safety of public water supplies was little involved in the question, as these supplies were derived then, as now, very largely from upland sources located in practically uninhabited drainage areas. The major problem to be met was the prevention of the gross degradation of streams which was leading to widespread conditions of nuisance and menace to fish life in numerous important rivers of those areas.

From an exhaustive series of investigations, described in nine separate reports with appendices, the British Royal Commission formulated two sets of standards. One dealt with limiting specifications for the composition of various trade-waste effluents, including those of coal washing, tin, lead, and zinc mining, paper making, brewing, oil distillation, wool scouring, and tanning. The other was concerned with the quality of sewage effluents, its more significant provisions being, in brief, that an effluent should not contain more than 30 parts per million of suspended matter and should have a 5-day B.O.D. (at 65° F.) not exceeding 20 parts per million. With various degrees of dilution in the receiving watercourse, ranging from 150 to over 500 volumes of water, this requirement was modified so as to permit as high as 150 parts per million of suspended matter in the effluent with dilutions up to 500 volumes.

As the basis of this standard, the commission formulated a working rule derived from an extensive survey of actual conditions, that the 5-day B.O.D. of a stream water polluted by a sewage effluent should not exceed 4 parts per million in order to maintain satisfactory conditions in the stream at a mean summer temperature of 65° F. and under dry-weather flow conditions. In formulating these requirements, the commission was influenced very materially by a general dictum, enunciated in 1878, that no river in England is long enough to purify itself completely.

In the United States, the first systematic effort to formulate a standard of pollution for rivers was that of Dr. Hering, who, in 1887, in reviewing evidence concerning the necessary dilution required for Chicago sewage in the Chicago Drainage Canal, concluded that the dilution provided should be at least 150 to 200 cubic feet of minimum stream flow per minute for each 1,000 persons discharging sewage into the stream. This led to the adoption of a minimum dilution of 3.3 cubic feet per second per 1,000 population.

Shortly after the formulation of the Hering dilution standard, Stearns, in a report to the Massachusetts Board of Health issued in 1890, introduced the custom of estimating the amount of various

constituents added to sewage by each inhabitant daily and then estimating what these constituents would be in the stream with dilutions ordinarily found in streams of varying degrees of pollution. Although no definite conclusion was drawn, he stated that the debatable limit of dilution would fall somewhere between 2.5 and 7.0 cubic feet per second per 1,000 population. In his Ohio report of 1898, Hazen introduced the qualification that in sluggish streams, or in streams already somewhat polluted, the proper dilution might be increased to 6.8 or 10 cubic feet per second per 1,000 persons. In 1902, Goodnough concluded from his surveys in Massachusetts that objectionable conditions were found in all cases where the dilution was less than 3.5 second-feet per 1,000 persons, but were not likely to be objectionable where the dilution exceeded about 6 second-feet.

As previously noted, these various dilution ratio standards, as well as that which the British Royal Commission formulated for sewage effluents, were based very largely on observations made in relatively small and short streams, where natural purification was not a very powerful influence, and they were concerned primarily with the prevention of conditions which would be termed as offensive, rather than with maintaining the safety of public water supplies, which was not materially involved in these situations.

During the past 25 years or thereabouts, the public health aspects of river and lake pollution have been receiving more attention, both in this country and abroad, as the result of a growing public consciousness of this phase of the problem. At the present writing a fairly clear distinction is being made by sanitary authorities between water pollution directly or indirectly affecting the public health and that which is concerned primarily with economic rather than health values, though in some cases the two interests are so intimately related that a sharp line of distinction can hardly be drawn between them. On this basis we may attempt a rough classification of water pollution problems as they now exist in this country and then consider briefly the present trend of thought relative to standards of pollution under each respective class.

The main items of such a classification might be stated somewhat as follows:

I. Pollution not affecting directly the public health.

- A. That which gives rise to conditions commonly included under the general term "nuisance", or which, though not causing actual "nuisance", may tend to damage the value of bordering property for residential, agricultural, or recreational uses.
- B. That which affects the maintenance of fish life in streams and lakes and the use of such water for recreational purposes.

C. That which may cause tastes, odors, or other undesirable qualities in public water supplies.

II. Pollution affecting the public health.

A. Excessive pollution of sources of public water supply, either by sewage or by toxic industrial wastes.

B. Pollution of edible shellfish-growing areas by sewage and industrial wastes.

C. Pollution of water areas used for bathing purposes.

Let us now consider some of the present tendencies in reference to standards of pollution under these headings.

STANDARDS OF POLLUTION NOT DIRECTLY AFFECTING PUBLIC HEALTH INTERESTS

The general tendency in fixing limits of pollution of waterways not used as sources of public water supply, or for shellfish culture, or for bathing purposes, has been, in this country at least, to specify a minimum permissible dissolved oxygen content of such waters under summer, low-water conditions, or to set some requirement as to a favorable balance between oxygen demand and oxygen supply.

For "nuisance" prevention, the limiting minimum dissolved oxygen content has been variously stated, ranging from as low as 25 or 35 percent to as high as 70 percent of the oxygen saturation value. In a recent report on the disposal of sewage in the Potomac River, Crohurst² notes that certain investigations in the Thames River below London and in the Delaware River at Philadelphia have indicated that, under conditions there existing, the dissolved oxygen in the supernatant stream could be as low as 10 or 20 percent without causing odors in the vicinity of the point of low oxygen content. On the other hand, a minimum D.O. as high as 70 percent of saturation was recommended by Black and Phelps³ as being desirable for New York Harbor, though other observers suggested later that this figure might be lowered safely to 25 or 35 percent, provided that sludge deposits could be kept under control. In the recent report of the Tri-State Treaty Commission of New York, New Jersey, and Connecticut, on measures for abating pollution of the harbor and coastal waters of the metropolitan area, the minimum dissolved oxygen recommended for class B areas, not used for bathing or shellfish culture, has been 30 percent of saturation, with the added requirement that not less than 10 percent of the suspended solids should be removed from the wastes discharged into these areas.

In several recent cases, as in the case of the Illinois River, a standard of pollution based on maintaining a positive oxygen "balance",

² Disposal of sewage in the Potomac River, United States, 72d Cong., 2d sess., Senate Document No. 172.

³ Black, W. M., and Phelps, E. B.: Discharge of sewage into New York Harbor. Report to New York City Board of Estimate and Apportionment. 1911.

or excess of available oxygen supply over oxygen demand, has been recommended. This viewpoint is somewhat like that underlying the British Royal Commission standard, which, as previously noted, was based on the principle of maintaining a 5-day B.O.D. in the stream water not exceeding 4 parts per million, a fairly safe margin for obtaining a positive oxygen balance.

For supporting fish life in streams and lakes, minimum oxygen standards are in general most widely favored in the United States, though the validity of this and other single criteria has been recently attacked by Hubbs,⁴ an expert in fisheries research, who points out that some conditions deleterious to fish are not reflected either by dissolved oxygen or by oxygen demand values in a stream water. Opinions as to the minimum amount of dissolved oxygen in a natural body of water necessary to support ordinary fish life have varied, some observers placing it as low as 2.5 parts per million, and others as high as 4.0 parts per million. Recent practice, however, has favored 3.0 or 4.0 parts per million as being desirable, when considered as an average minimum, and the present trend is toward even higher concentrations where the maintenance of all normal forms of fish life is involved.

In this connection Hubbs notes the "minnow test", as used in New York, and the reserve oxygen criterion, in which an excess of dissolved oxygen over oxygen demand amounting to upwards of 3 parts per million is specified. Although he regards the "minnow test" as unreliable, because of the variation of different species of minnows in their viability, he considers the "reserve oxygen" type of standard as being a step in the right direction, as compared with the simple minimum dissolved oxygen requirement. He points out, however, that the application of standards of this kind on the basis of average observations may be misleading, citing as an example an instance in which, owing to algae growths, the observed dissolved oxygen content during sunny daylight hours ran as high as 200 percent saturation, but during the night, and especially in the early morning, it became practically exhausted. Under such conditions numerous fish could be killed during a comparatively short period of oxygen depletion. Sewage sludge deposits are considered by Hubbs as being particularly detrimental to fish life, as they interfere with the normal spawning process.

The presence of undesirable tastes and odors in water supplies and means for correcting them have engaged the attention of sanitary chemists and biologists for many years. More recently, this problem has become one of primary importance, owing to the extreme sensitiveness of the consuming public to the aesthetic properties of their drinking water and to the increasing difficulties experienced in removing tastes and odors from water supplies derived from highly polluted

⁴ Hubbs, C. L.: Sewage Treatment and Fish Life. *Sewage Works Journal* 5, 1933, 1033-40.

sources. In some instances, as where phenols and cresols are present, treatment may only serve to intensify these disagreeable effects. In others, as where the products of organic decay are present, the resulting tastes and especially odors may be very difficult to remove once they have become established.

Although no definite standards have been adopted in these cases, a systematic effort is being made in several States to eliminate known sources of pollution by taste-producing substances. Phenol-bearing wastes have been a special point of attack in this connection, as it is now recognized that the only certain way to prevent tastes originating in wastes of this character is to divert them entirely from streams and lakes used as sources of water supply. A basis for more accurate measurement of tastes and odors in water supplies has been recently established through the work of Spaulding and Baylis in Illinois and that of Fair and his associates at Harvard University. With such improved tests now available, a more precise definition of taste and odor standards and their application is possible.

In some sections of the United States pollution of sources of public water supply by certain mineral substances has an important bearing on the general suitability of these supplies for domestic and industrial use, entirely aside from its possible effects on the public health. In the oil field areas of the southwestern States, for example, the increasing contamination of both surface and ground waters by sodium chloride, or common salt, originating in brines associated with oil deposits, has given rise to a problem of growing seriousness as affecting the general suitability of water supplies derived from these sources, as no practicable method of water treatment can remove this constituent. In some of the western States pollution of water supplies by sodium salts and other hardness-bearing minerals has resulted in another problem of similar import. In the coal-mining regions of Pennsylvania and West Virginia the leaching of acid mine-wastes into surface streams has impaired the suitability of both industrial and domestic water supplies in these sections. These are only a few of numerous instances of mineral pollution, largely due to the intensive operation of certain industries which, if not curbed, may conceivably result ultimately in making some portions of these areas almost uninhabitable by large aggregations of population.

In promulgating a revised official standard of quality for drinking water supplies furnished to the traveling public by the interstate carriers, the United States Treasury Department, acting through an advisory board of the Public Health Service, included in the standard a specification as to the limiting permissible concentrations of certain mineral salts producing undesirable tastes and hardness in such waters. Among these salts, chlorides and sulphates are limited each to 250 parts per million, magnesium to 100 parts per million,

and carbonates of sodium and potassium to 50 parts per million. It is of interest to note in this connection that an important city in the southwestern part of the United States recently was obliged to discard consideration of a nearby surface source of water supply, though ample in quantity, because the chloride content of water obtainable from this source was found to be in excess of the limit fixed by the Treasury Department standard.

STANDARDS OF POLLUTION AFFECTING PUBLIC HEALTH

It has been previously noted in this paper that the three main effects of river and lake pollution in the United States related to the public health are those which have to do with the safety of (1) public water supplies, (2) shellfish growing areas, and (3) public bathing places. Before taking up the most important of these, which is, of course, the effect on public water supplies, let us consider the two others in the order named.

In the year 1925, following outbreaks of typhoid fever in various cities of the United States in 1924, definitely traced to infections received from eating contaminated oysters, the Federal Government, through the Public Health Service, established in cooperation with the States a system for controlling the sanitation of the shellfish industry, including the water areas used for growing purposes. In this connection, a tentative standard was suggested for limiting bacterial pollution of the waters in which shellfish were grown, this standard providing that the waters should ordinarily not show the presence of *B. coli* in 1 cc amounts, tests being made in 10, 1.0, and 0.1 cc volumes according to the Standard Methods of the American Public Health Association. A modification of this standard, which, in effect, limited the *B. coli* index of these waters to 10 per 100 cc, was later suggested, permitting the waters to show *B. coli* in 50 percent or less of the 1 cc amounts tested. The effect of this modification was to fix a maximum *B. coli* index of 50 per 100 cc for ruling out waters from market shellfish growing. This standard is now applied in a number of States cooperating in shellfish sanitation.

Under the leadership of Gage, a joint committee of the American Public Health Association and the Conference of State Sanitary Engineers issued, in 1926 and 1928, reports suggesting comprehensive standards for the sanitation of bathing pools. In 1932 the committee, under the chairmanship of Scott, extended the scope of its activities to considering standards for outdoor bathing places, including those located in natural bodies of water. In its 1932 report the committee notes existing practice in certain States relative to bacterial standards of pollution for natural waters used for bathing purposes.

According to their report, the proposed standard in California limits the *B. coli* index of these waters to 1,000 per 100 cc. In New

York City a limiting standard of 3,000 per 100 cc is used. From a study of Connecticut waters, Winslow and Moxon have suggested that possibly an average of not over 100 *B. coli* per 100 cc with a maximum not over 1,000 might be a reasonable figure for such a standard. The Connecticut State Department of Health recently completed an extensive survey of shore bathing waters in that State, from which the following classification of these waters was made on the basis of their average *B. coli* content:

Class	Average <i>B. coli</i> index per 100 cc	Percentage of shore mileage
A-----	0-50	64.0
B-----	51-500	18.6
C-----	501-1,000	10.2
D-----	Over 1,000	7.2

Class A was considered good; class D was very poor, with the two intermediate classes ranging from doubtful to poor. It is of interest to note that there was exact correlation of the analysis and sanitary survey in 62 percent of the total areas and that an additional 37 percent showed a difference of only one class, leaving only 1 percent of the total area where the analytical results did not check up with the sanitary survey data.

If the Connecticut classification were applied to the other standards above noted, the New York City standard would admit all four classes from A to D; the California standard would admit all but class D, and the Winslow-Moxon, classes A and B. The United States Public Health Service's tentative shellfish water standard of 50 *B. coli* index per 100 cc would admit class A only. The committee recommends adoption of the Connecticut classification as the basis of further study, which it feels should be given especially to defining the proper status of classes B and C.

The question of pollution standards for water areas used for recreational purposes has been closely related to that of bathing water standards. The Tri-State Pollution Commission, previously mentioned in this paper, has dealt with this question by including recreational water areas in class A in its scheme of classifying those of the metropolitan district surrounding New York City. For this class, all sewage discharged into such waters must be treated so as to remove all floating solids and at least 60 percent of the suspended matter, and to effect a reduction in *B. coli* organisms consistent with the requirement for class A waters in the Connecticut scheme (i.e., having a *B. coli* index not exceeding 50 per 100 cc).

It thus appears that for the better class of water areas devoted to shellfish culture, to public bathing, or to recreational uses, a distinct

tendency now exists to work toward a bacterial standard represented by a limiting *B. coli* index approximating 50 per 100 cc. It is of interest to note that this single standard has been reached by separate agencies working on three different kinds of water-use problems. It will be shown presently that this standard also practically coincides with what has been determined as the upper limit of bacterial pollution of raw waters subjected to chlorination alone, for public water supplies, which will be the next and final aspect of this subject to be considered here.

The history of efforts to formulate standards of pollution for sources of public water supplies is comparatively recent, extending back only to the year 1914, when the International Joint Commission of Canada and the United States adopted as a standard of this kind the rule that the yearly average *B. coli* index of sources of water supply located in the international boundary waters between the two countries should not exceed 500 per 100 cc. This standard was based on the joint opinion of a board of expert sanitary engineers employed by the commission, who formulated it on the assumption that all public water supplies derived from the boundary waters should be purified to such an extent that their *B. coli* content would not exceed the limit imposed by the original Treasury Department official water standard (i.e., a *B. coli* index of 2 per 100 cc).

Shortly after the International Joint Commission standard was recommended, the United States Public Health Service, in connection with its investigation of stream and lake pollution, began a comprehensive field and experimental study of the efficiency and limitations of current water-purification systems under conditions of practical operation, with a view to establishing, if possible, an empirical basis of formulating standards for various general types of raw-water sources, combinations of water treatment, and desired qualities of final effluent, the latter being in anticipation of further revisions of drinking-water standards, such as that of the Treasury Department, which might be made from time to time. During the progress of that study, the Treasury Department water standard was revised (in 1925) so as to provide, in effect, that the average *B. coli* index of drinking water served by the interstate carriers should not exceed 1.0 per 100 cc, with a permissible range of variation up to 6.0 per 100 cc in not more than 5 percent of the samples examined.

The results of that study, which have been published from time to time, have indicated that, for the average efficient modern water-filtration plant of the usual rapid sand type, with postchlorination included, the maximum raw water *B. coli* index yielding a final effluent conforming to the revised Treasury Department *B. coli* standard will approximate 5,000 per 100 cc, as a round number, for

all classes of water sources considered, including the Great Lakes and rivers of the general type found in the Great Mississippi Basin.

If a single limiting standard of pollution for both river and lake sources of purified water supplies in this general area were to be recommended from the results of the Public Health Service study, a rounded *B. coli* maximum of 5,000 per 100 cc, expressed in terms of the Phelps index, or a corresponding maximum of about 9,000 per 100 cc when expressed in terms of the "most probable number", would appear to be the most rational basis available for such a standard, for the following two reasons: (1) It represents, within the range of expected error, the limiting content of raw water *B. coli* organisms observed for each group of filtration plants studied, as being consistent with the production of final effluents meeting the current Treasury Department drinking-water standard, and (2) it marks approximately the critical average density of raw water pollution above which difficulties in effective treatment and in obtaining palatable and otherwise satisfactory effluents for domestic use have been observed quite consistently as beginning to appear.

In applying a standard of this kind, due account would have to be taken of the fact that the *B. coli* density above stated is a limiting *maximum*, rather than a limiting *average*, and that a raw water having a yearly average *B. coli* index of 5,000 or thereabouts might show a considerable excess of *B. coli* content over this amount for a significantly large proportion of the time. For this reason it might be necessary, in formulating it, to use a working factor of safety, either by scaling down the permissible limit below 5,000, as a yearly average, or by requiring an average quality of final effluent somewhat better than that which is represented by the *B. coli* limit fixed by the present Treasury Department standard (which, in fact, would have the same effect). On the other hand, it is entirely possible that some form of supplementary water treatment, such as prechlorination, preliminary storage, or prolonged sedimentation, might provide a sufficiently ample working margin of safety in individual cases to cover adequately all ordinary variations in raw-water pollution above a yearly average limit expressed by a *B. coli* index of 5,000. Should the matter of adopting a definite standard of bacterial pollution for sources of purified municipal water supplies become one of primary importance from an official public-health standpoint, as is entirely within the range of possibility during the next few years, this question doubtless would receive careful consideration.

Where conditions are such that the only form of water treatment practicable is simple chlorination, the Public Health Service study has indicated that a safe bacterial limit of raw water pollution for all classes of waters considered would be represented by a *B. coli* index

approximating 50 per 100 cc,⁸ which, it may be noted, is the same as that which has been adopted as the upper limit of pollution of waters used for shellfish-growing and for public bathing.

Before concluding this paper, a few statements may be added concerning the relation of standards of chemical pollution to the safety of public water supplies. These chemical standards are becoming more important with the growing recognition of the harmful effects which wastes from certain industries are having on the hygienic quality of public water supplies. Although the present Treasury Department water standard fixes a definite limit to the content of certain metals, such as lead and copper, which have been more or less definitely associated with poisonous effects produced on consumers of water containing them, other toxic substances have become matters for serious concern in water supplies during the past few years since the present Treasury Department standard was promulgated. Among these are phenols and cresols, together with their chlorine derivatives, fluorine and fluorides, barium salts, and also cyanides, which recent British studies have shown to have been responsible for killing many young fish in the River Tees. With the present tendency toward using barium salts in connection with water-softening operations, a close watch must be maintained over the use of this chemical, which is known to be toxic to human beings in small concentrations. It may be earnestly hoped that action will be taken in the not distant future to define the safe physiological limits of these various toxic substances in public drinking water supplies and to incorporate them into standards which may be adopted for such supplies in the future.

In conclusion, the present situation with reference to standards of river and lake pollution may be summed up very briefly as follows: The older standards, based on fixed dilution ratios, are being superseded by more definite specifications of certain indicators of relative cleanliness, such as bacterial content, dissolved oxygen, oxygen demand, and known toxic chemical substances. Where the public health is involved, limiting standards of bacterial quality, notably with respect to the density of organisms of the *B. coli* group, are becoming of primary importance, though in some instances limitation of chemically toxic substances is almost equally significant. At the present writing a reasonably firm empirical basis exists for the formulation of working standards of pollution for practically all waterways in this country used as sources of public water supply. This should

⁸ This rounded figure has been obtained by averaging 3 separate maxima, 30, 50, and 80 per 100 cc, derived from 3 independent series of observations. The first was obtained from experimental observations on the purification of Ohio River water (see Public Works, Dec. 1933, pp. 17-20), and the second and third, from combined performance data for 2 large groups of municipal filtration plants located, respectively, along the Ohio River and the Great Lakes (see Public Health Reports, Apr. 14, 1933, pp. 377-400; Reprint 1566, p. 20). As all 3 maxima fall within a common range of expected observational error, their mean is a fairly representative average for all conditions embraced by the combined results.

be done in the near future, so as to coordinate efforts in the various States toward a rational and uniform policy in dealing with this problem, especially in its interstate aspects.

A fairly good basis also now exists for the formulation of tentative standards of pollution for shellfish-growing areas and for natural bodies of water utilized for public bathing. In the latter case, however, caution will be necessary in attempting to meet a bathing-water standard in some natural waterways subject to noncontrollable pollution by surface drainage water and storm sewage. In some of these instances, at least, the extent of dilution provided would not be sufficient to permit conforming to such a comparatively rigid standard, even if the effect of all of the dry-weather sewage entering the waterway were to be removed through adequate treatment.

Where the public health is not involved, the minimum dissolved oxygen standard appears to be the most simple and readily applied one for general application, though a distinct trend toward oxygen "balance" criteria is apparent. Some question remains as to just where the minimum oxygen level should be placed in specific cases, with a strong tendency to fix it at not lower than 3 or 4 parts per million and at even higher concentrations in some cases. As organic sludge deposits are particularly harmful to fish life and tend to exert a disproportionately heavy oxygen demand on overlying bodies of water, a definite need exists for standards of sewage- and industrial-wastes treatment adequately stringent to result in practically eliminating these deposits from all streams and lakes.

On the part of the general public, there is a growing consciousness of the dangers and economic losses inherent in the excessive pollution of our waterways by sewage and industrial wastes. With the increase in leisure for all classes of our population and the consequently wider opportunities open to everyone for the enjoyment of streams and lakes for various forms of recreation, this consciousness will become more acute and wide-spread during the next few years. This tendency points toward more specific and increasingly rigid standards of cleanliness for all public bodies of water, which are the natural heritage of our people. The old cry of "laissez faire" is out of date in this as in other fields of civilized human life, and the present trend of thought and action carry both a warning and an opportunity to those who are qualified to exert leadership in formulating and putting into effect adequate standards of this kind. As to such standards, it might well be said by way of caution: Let us devise them, try them, revise them, and apply them, but also remember that they are but "feeble instruments of human will" and, like all such tools, are made to be discarded for better ones when they become worn out.

RECENT COURT DECISIONS ON MILK CONTROL ¹

By JAMES A. TOBEY, LL.B., Dr. P.H., *Director of Health Service, The Borden Company, New York, Member of the New York Bar*

Judicial pronouncements on milk during the past few years should be a source of inspiration to dairymen and health officials alike. The sagacious principles set forth by the learned judges will appeal to the dairy industry because of the recognition accorded the nutritional value of milk; and these decisions will likewise find favor with health officials because of the liberality with which all reasonable regulation of milk in the interests of public health and welfare is upheld.

"It is well recognized throughout this and all other civilized countries", declared the court in a recent decision,² "that milk is a valuable and universal food product; that it is peculiarly liable and subject to contamination and adulteration; that the business of producing and distributing milk is one [which], when improperly conducted or carelessly handled, may seriously affect the public health; that in the interest of public health and safety the regulation of the production and distribution of milk is within the police power of the sovereignty; and that strict and burdensome regulatory provisions may be enacted and enforced to guarantee to the consumer that protection which the sovereignty owes to him."

These rational statements constitute an epitome of the established law on milk control. Since my report on this subject in 1932,³ however, there have been delivered by the courts of last resort in this country about a dozen significant opinions on various aspects of milk sanitation and control. These leading decisions have been concerned with price fixing in the interest of public health, the control of undulant fever, the eradication of bovine tuberculosis, pasteurization, typhoid carriers, and the marking of milk bottles, all subjects of vast economic and sanitary significance.

CONTROL OF MILK PRICES

Perhaps the most important of the recent cases on milk is a decision of the United States Supreme Court⁴ upholding an emergency law of New York creating a State milk control board. Such board, under the law, was authorized to investigate and regulate the milk industry, was required to fix minimum and maximum wholesale and retail prices of milk, and was empowered to license all milk dealers and to revoke their licenses for specified causes. This law had already been sustained by

¹ Presented at the 49th Annual Conference of State and Provincial Health Authorities of North America, Washington, D.C., June 5, 1934.

² *Logan v. Alfieri* (Fla., 1933), 148 So. 872.

³ Tobey, J. A.: Recent court decisions on milk control. *Pub. Health Rep.*, Dec. 2, 1932. (Reprint No. 1555.)

⁴ *Nebbia v. New York* (1934), 54 S.Ct. 505, 78 L. Ed. 563, 89 A. L. R. 1409. See also editorial: State Control of Milk Prices. *Am. Jour. Pub. Health*, April 1934.

the court of appeals of the State of New York,⁵ the chief justice of this court having stated piquantly in his opinion that—

"The production of milk is, on account of its great importance as human food, a chief industry of the State of New York. It is of such paramount importance as to justify the assertion that the general welfare and prosperity of the State in a very large and real sense depend upon it."

The United States Supreme Court, dividing 5 to 4, held that, while milk is not a public utility, the milk industry is certainly one that is subject to reasonable regulation in the public interest, stating that it has been regulated by numerous acts of the legislature, the constitutionality of which has been frequently sustained by the courts. On behalf of the majority, Mr. Justice Roberts called attention to the findings of the State legislative commission that milk is an essential article of diet which must be properly safeguarded, that the dairy industry is of vast significance to the economic life of the people, that there is a huge surplus of milk, and that a satisfactory stabilization of prices for fluid milk requires that the burden of surplus milk be shared equally by all producers and distributors in the milk shed.

During the past 30 years or more, the Supreme Court of the United States has rendered half a dozen important decisions on milk control.⁶ These decisions uphold the power of the States to regulate the sanitary production of milk, to delegate the supervision of milk control to local health authorities, to prohibit the entry into a State of impure milk or diseased cattle, to require tuberculin testing, and to ban the sale of filled milk. None of these cases is, however, as far-reaching in scope as the Court's recent decision which holds that price fixing, when not arbitrary or discriminatory, is a constitutional exercise of the police power, the State's inherent authority to regulate in the interest of the health, safety, comfort, morals, and welfare of the people.

Since this noteworthy decision, a Federal statutory court in New York has sustained the provision in this same law empowering the State Milk Control Board to fix minimum prices for milk, even though some concerns may be forced out of business because of this provision.⁷ A Federal district court in Illinois has also upheld the provisions of the Federal Agricultural Adjustment Act, which authorize the Secretary of Agriculture to revoke licenses of milk dealers in the Chicago sales area for actual violations of the statute.⁸

However, in a decision of the appellate division of the New York supreme court,⁹ it is held that a State milk board may not act in an

⁵ *People v. Nebbia* (1933), 262 N.Y. 259, 186 N.E. 604.

⁶ Tobey, J. A.: *Public Health Law*. Williams & Wilkins, 1926.

⁷ *Hegeman Farms Corporation v. Baldwin* (1934), 6 F. Supp. 297.

⁸ *U.S. v. Shisler* (1934), — F. Supp. —.

⁹ *Grandview Dairy, Inc., v. Baldwin* (1934), 239 App. Div. 640, 269 N.Y.S. 116.

arbitrary manner in revoking licenses. Here a milk dealer's license had been taken from him without a proper hearing. This action was considered by the court to be contrary to the privilege and right of due process of law guaranteed to all citizens by the Federal Constitution, and was, therefore, declared null and void as a usurpation of judicial powers.

UNDULANT FEVER

Another important decision of the United States Supreme Court is one handed down in May 1933 in which an order of a State commissioner of agriculture and markets, designed to prevent the bringing into the State of cattle infected with Bang's disease, or contagious abortion, was upheld as a constitutional exercise of the police power of the State.¹⁰ In this case the commissioner had denied entry into New York State of a herd of cattle from Wisconsin because such herd was not accompanied by a certificate showing freedom from Bang's disease, which is the cause of undulant fever in humans. The order, said the Court, was an inspection measure, undoubtedly promulgated in good faith and appropriate for the prevention of further spread of the disease among dairy cattle and to safeguard public health.

This case is the first on record dealing with public-health measures for the control of undulant fever. A subsequent decision in Idaho holds that undulant fever occurring in an instructor of dairying at a State industrial training school is not an occupational disease in the legal sense of the term, but is compensable under the workmen's compensation act.¹¹

BOVINE TUBERCULOSIS

Laws relating to the eradication of bovine tuberculosis have been declared constitutional in numerous decisions by the courts,¹² including two leading ones in Minnesota.¹³ In 1932 the Minnesota supreme court ruled as valid a statutory amendment giving county boards discretionary power to provide for tuberculin testing and requiring them to do so when a petition was filed.¹⁴ "The counties and their officers", said the court, "are made use of by the State, not to effect any local or county purpose, but as agencies in the performance of its own paramount governmental duty to protect public health".

Another of the leading cases on tuberculin testing is an Iowa decision of 1926.¹⁵ In 1932 the Iowa Supreme Court denied an injunctive

¹⁰ *Mintz v. Baldwin* (1933), 280 U.S. 346, 53 S.Ct. 611.

¹¹ *Crowley v. Idaho Industrial Training School* (1933), 29 P (2d) 180.

¹² Tobey, J. A.: The legal phases of milk control. Reprint 1343, U.S. Public Health Service. 1930.

¹³ *State v. Nelson* (1896), 66 Minn. 166, 34 L.R.A. 318, 61 Am. St. Rep. 399, 68 N.W. 1098; *Nelson v. Minneapolis* (1910), 112 Minn. 16, 29 L.R.A. (NS) 260, 127 N.W. 445.

¹⁴ *State ex rel. Benson v. Board of Com'rs of Pine County*. (1932), 243 N.W. 851.

¹⁵ *Fevold v. Board of Supervisors of Webster County*, 210 N.W. 139, 202 Ia.1019.

tion to restrain the testing of cattle for tuberculosis and construed the law to mean, among other things, that cattle could be tested before appraisal, that the tuberculin test was part of the examination of cattle, and that notice to owners of the day and hour of the test need not be given.¹⁶

PASTEURIZATION

During the past 20 years the highest courts of 11 States have delivered 14 interesting opinions on the subject of the pasteurization of milk. As has been previously reported,^{12 17} these courts have almost unanimously upheld requirements that certain milk supplies be pasteurized in accordance with methods approved by the health authorities, and two of the decisions have even approved the requirement that milk be pasteurized within the city where it is sold.¹⁸

Directly contrary to this last principle is a recent Minnesota decision in which a city ordinance, requiring all pasteurized milk sold in the city to be pasteurized within the city limits, was asserted to be unreasonable and consequently invalid.¹⁹ The court held that it was convenient for the city to inspect pasteurization plants beyond the city boundaries and that an adequate license fee could be charged for that purpose.

Here we have another example of a conflict of decisions in the various States, in this instance with regard to the extent of the jurisdiction over pasteurization. It would seem, however, that the location of a pasteurization plant, is, within reasonable limitations, far less important to the public health than the care, skill, and probity with which it is operated.

In a recent Colorado case²⁰ an injunction was granted against an order of the manager of health and charity of the city of Denver requiring all milk and cream to be pasteurized, because his order was in direct conflict with a city ordinance permitting the sale of raw milk. This decision is not, of course, adverse to the cause of pasteurization, but was reached merely because a zealous health official used the wrong legal methods to attain a worthy end. There was a case in Connecticut in 1930²¹ involving a conflict between an ordinance and State statutory provisions.

Somewhat on this same principle is a recent Kentucky case²² in which the court of appeals decided that a city milk ordinance did not

¹⁶ *Peverill v. Dept. of Agriculture*, 245 N.W. 334.

¹⁷ Tobey, J. A.: Court decisions on pasteurization. Reprint 1168. U.S. Public Health Service. 1927.

¹⁸ *Witt v. Klimm* (Calif., 1929), 274 P. 1039; *Lang's Creamery v. Niagara Falls* (N.Y. 1928), 231 N.Y.S. 368, 224 App. Div. 483, aff. in 251 N.Y. 343, 167 N.E. 464.

¹⁹ *State ex rel. Larson v. City of Minneapolis* (1933), 251 N.W. 121.

²⁰ *City and County of Denver v. Gibson* (1933), 24 P. (2d) 751.

²¹ *Shelton v. City of Shelton*, 150 A. 811.

²² *Board of Councilmen of City of Frankfort v. Commonwealth* (1932), 40 S.W. (2d) 549.

apply to a State penal institution located in the city and that a milk dealer might deliver milk to the prison without a permit from the city.

Injunctions against pasteurization regulations of local health departments were denied without opinion by the New York supreme court in 1933 in two instances.

TYPHOID CARRIERS

An interesting New York case which rather indirectly concerns milk sanitation was decided in March 1934.²³ A typhoid carrier, who, as seems customary with such afflicted persons, was by trade a dairy worker, had been quite properly debarred by the State commissioner of health from ever being employed on a dairy or in the handling of food. Since he felt incompetent to engage in any other occupation, he sought to recover from an insurance company in which he had a policy covering total disability. The court decided that he was not physically disabled within the meaning of the policy and that he was prevented from obtaining appropriate work solely by the edict of the State. In its opinion, the court discussed the plight of typhoid carriers and described the condition rather fully. This decision is the first to pass upon this particular question, although the quarantine of a typhoid carrier was upheld by an Illinois court in 1922.²⁴

MILK BOTTLES

It is well settled law that reasonable requirements for the marking and identification of milk bottles and other containers, for the registration of names and marks, and for the prohibition of the improper use of milk bottles by persons having no title to them form a valid exercise of the police power of the State.

What is a "reasonable" requirement with respect to the marking of milk bottles was determined by the Florida supreme court in a recent decision, a quotation from which is given at the beginning of this paper.²⁵ In this case an ordinance of the city of Tampa stated that it should be unlawful for milk bottles and other containers to bear any name or trade mark other than that of the producer or distributor whose name appeared on the cap or seal. The court took the position that this was an unreasonable requirement, since it would prohibit such an innocuous matter as the name of the manufacturer of the bottle. The court displayed sympathy with the desire of the city to achieve milk sanitation and to regulate the proper use of

²³ *Gates v. Prudential Ins. Co. of America*, 270 N.Y.S. 282.

²⁴ *People ex rel. Barmore v. Robertson*, 302 Ill. 422, 134 N.E. 815, 22 A.L.R. 635. See also Tobey on Public Health Law, page 116.

²⁵ *Logan v. Alfieri* (1933), 148 So. 872.

bottles, but stated that the ordinance as drawn was faulty in that it contained arbitrary and unreasonable provisions.

MISCELLANEOUS

A Federal district court in Illinois ruled recently that the Federal filled milk law, which prohibits shipment in interstate commerce of compounds of milk and other products, was unconstitutional.²⁶ In 1931 the Illinois supreme court decided that a filled milk law of that State was invalid,²⁷ although the United States Supreme Court has held that a compound, such as would ordinarily come within the definition of filled milk, violated a State law setting up standards for condensed milk.²⁸

In Kansas a district court on May 1, 1934, sustained a comprehensive city ordinance regulating milk, an ordinance that has been recommended for adoption by the United States Public Health Service. In a provocative opinion the court pointed out that milk from a dirty dairy often looks and tastes like milk from a dairy where "surgical cleanliness" is maintained.²⁹ When dairies generally attempt to achieve such an ideal, even though impossible, condition as surgical cleanliness, the problems of milk sanitation will be solved.

SUMMARY

These court decisions, as well as others which have been reported during the last decade or more,^{6 12 17 27} indicate that the judiciary takes the view that pure milk is a most important food of man,³⁰ and that all reasonable regulations as to its production, handling, distribution, price, and sale constitute a proper and valid exercise of the police power of the State and its political subdivisions in the interests of the health and welfare of the people.

COURT DECISION ON PUBLIC HEALTH

An injunction suit, brought against city because of pollution of oyster beds by city's sewage, dismissed.—(Florida Supreme Court, Division B; *Gibson et al. v. City of Tampa*, 154 So. 842; decided April 27, 1934.) In an injunction suit brought against the city of Tampa, the supreme court handed down a per curiam opinion reading as follows:

²⁶ *U.S. v. Carolene Products Co.* (1934), — F. Supp. —.

²⁷ *People v. Carolene Products Co.*, 345 Ill. 166, 177 N.E. 636. See also Tobey, J. A.: Recent court decisions on milk control. Pub. Health Rep., Dec. 2, 1932. (Reprint No. 1555.)

²⁸ *Ilebe Co. v. Shaw* (1919), 248 U.S. 297, 39 S.Ct. 125, 63 L. Ed. 255.

²⁹ *Billings v. City of Hutchinson*. See Public Health Reports, June 8, 1934, vol. 49, p. 634.

³⁰ *Crumbine, S. J., and Tobey, J. A.: The most nearly perfect food.* Williams & Wilkins. 1929. See also Tobey, J. A.: Milk: The indispensable food. Olsen. 1933.

The decree appealed from dismissed a second amended bill of complaint brought to enjoin the city from discharging "raw or untreated sewerage" into the waters connected with the city and for incidental relief; it being alleged that such discharge peculiarly injures complainants' oyster beds in connecting waters. There being no clear showing as against the city for the equitable relief prayed, the decree dismissing the bill of complaint is affirmed without prejudice to rights, if any, complainants might have to maintain an action at law to redress the alleged injury.

Affirmed.

In this opinion five justices concurred. In a concurring opinion, participated in by four of these justices, the following was said:

A court of equity may properly refuse to grant an injunction when it appears that greater injury and inconvenience will be caused to the defendant by granting the injunction than will be caused to the complainant by refusing it. See cases cited in briefs of counsel appended to *State of Missouri v. State of Illinois*, 200 U.S. 496, 26 S. Ct. 268, 50 L. Ed. 572. And laches in such cases is universally held to be a bar to the drastic remedy of injunction. My view is that the present case is clearly within *City of Harrisonville v. W. S. Dickey, etc., Co.*, 289 U.S. 334, 53 S. Ct. 602, 77 L. Ed. 1208, where it was held that injunction will be denied where substantial redress can be afforded by payment of money, even in cases where fact of nuisance is clearly established.

DEATHS DURING WEEK ENDED AUG. 4, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 4, 1934	Correspond- ing week, 1933
Data from 86 large cities of the United States:		
Total deaths.....	7, 139	7, 601
Deaths per 1,000 population, annual basis.....	9.9	10.6
Deaths under 1 year of age.....	874	858
Deaths under 1 year of age per 1,000 estimated live births.....	53	¹ 46
Deaths per 1,000 population, annual basis, first 31 weeks of year.....	11.9	11.3
Data from industrial insurance companies:		
Policies in force.....	67, 614, 450	67, 678, 825
Number of death claims.....	12, 533	11, 185
Death claims per 1,000 policies in force, annual rate.....	9.7	8.6
Death claims per 1,000 policies, first 31 weeks of year, annual rate.....	10.4	10.2

¹ Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Aug. 11, 1934, and Aug. 12, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 11, 1934, and Aug. 12, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933
New England States:								
Maine.....					4	4	0	0
New Hampshire.....					1	3	0	0
Vermont.....					5	8	0	0
Massachusetts.....	11	15			20	77	0	1
Rhode Island.....					12	2	0	0
Connecticut.....	3	2	1	3	10	10	1	0
Middle Atlantic States:								
New York.....	12	26	14	14	99	204	2	7
New Jersey.....	19	5	4		40	23	0	1
Pennsylvania.....	32	40			394	116	5	4
East North Central States:								
Ohio.....	15	24	33	21	101	15	2	3
Indiana.....	3	11	22	18	13	4	1	4
Illinois.....	12	9	4	3	66	13	7	6
Michigan.....	7	20	1	3	24	28	0	0
Wisconsin.....	2	4	13	22	133	38	0	1
West North Central States:								
Minnesota.....	1	5		1	5	11	0	0
Iowa.....	3	9			8		0	1
Missouri.....	24	12	1		13	12	2	1
North Dakota.....	3				11	18	0	0
South Dakota.....	2	3		4	16		0	0
Nebraska.....	6				3	6	0	0
Kansas.....	7	7	1	2	15	11	3	0
South Atlantic States:								
Delaware.....		1	2		3		0	2
Maryland.....		4		1		2	0	0
District of Columbia.....			234	1	8		0	0
Virginia.....	9	13				10	0	0
West Virginia.....	12	23	140	8	41	31	0	1
North Carolina.....	17	23			17	14	1	1
South Carolina.....	4	5	58	61	27	34	0	0
Georgia.....	7	23			10	34	0	3
Florida.....	14	6			34	24	0	0

See footnotes at end of table.

(1000)

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended Aug. 11, 1934, and Aug. 12, 1933—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933
East South Central States:								
Kentucky.....	6	18			14		0	3
Tennessee.....	5	11	7	3	15	21	1	2
Alabama ⁴	16	27	3	11	36	6	1	1
Mississippi ¹	12	13					0	0
West South Central States:								
Arkansas.....	5	3				42	0	0
Louisiana ⁴	13	13	2	2	4	2	0	0
Oklahoma ⁴	1	8	4			2	0	1
Texas ⁴	33	54	54	15	43	82	1	0
Mountain States:								
Montana ²	2	1	2		14	2	0	0
Idaho.....	1				4	3	0	0
Wyoming ¹					7	4	0	0
Colorado.....	2	3			18	2	0	1
New Mexico.....			68		10		0	0
Arizona.....		3		1	3	2	0	0
Utah ²				1	1	18	0	0
Pacific States:								
Washington.....	3		1		12	15	0	0
Oregon.....		1	8	9	5	16	0	0
California.....	21	16	5	13	65	97	1	2
Total.....	351	469	672	206	1,399	1,112	28	46

Division and State	Polliomylitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933
New England States:								
Maine.....	1	2	1	4	0	0	0	4
New Hampshire.....	0	0	1	7	0	0	0	0
Vermont.....	0	1	4	7	0	0	0	0
Massachusetts.....	6	29	35	50	0	0	10	2
Rhode Island.....	0	1	5	4	0	0	0	1
Connecticut.....	1	2	3	12	0	0	3	3
Middle Atlantic States:								
New York.....	9	100	118	85	0	0	36	64
New Jersey.....	7	9	30	14	0	0	18	4
Pennsylvania.....	10	27	101	113	0	0	29	49
East North Central States:								
Ohio.....	19	15	77	122	0	1	39	32
Indiana.....	1	0	7	22	1	0	28	32
Illinois.....	10	6	72	92	0	1	51	30
Michigan.....	4	2	66	64	0	1	29	8
Wisconsin.....	3	2	31	9	4	10	9	3
West North Central States:								
Minnesota.....	1	11	11	15	0	1	2	0
Iowa ²	1	2	10	13	0	1	13	1
Missouri.....	1	2	12	11	0	0	64	20
North Dakota.....	0	6	3	5	0	0	0	0
South Dakota.....	4	3	6	2	1	0	2	7
Nebraska.....	0	0	3	3	0	0	1	2
Kansas.....	9	2	18	23	0	0	25	8
South Atlantic States:								
Delaware.....	0	0	3	3	0	0	2	4
Maryland.....	2	1	10	27	0	0	21	19
District of Columbia ²	0	0	1	5	0	0	1	0
Virginia ²	7	2	20	25	0	0	32	50
West Virginia.....	4	4	17	17	0	0	32	61
North Carolina ²	4	0	21	86	1	0	30	24
South Carolina.....	2	1	2	1	0	0	31	34
Georgia ⁴	0	0		7	0	0	70	48
Florida ⁴	1	0	1		0	0	1	7

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 11, 1934, and Aug. 12, 1933—Continued

Division and State	Poliomyelitis		Scarlet Fever		Smallpox		Typhoid fever	
	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933	Week ended Aug. 11 1934	Week ended Aug. 12 1933
East South Central States:								
Kentucky.....	0	2		49	0	0	28	120
Tennessee.....	1	5	12	33	0	0	81	73
Alabama ¹	3	1	14	16	0	0	28	31
Mississippi ¹	0	0	12	5	0	9	17	24
West South Central States:								
Arkansas.....	0	0	2	1	2	0	31	25
Louisiana ¹	1	0	4	9	0	6	39	55
Oklahoma ¹	1	0	4	3	0	0	40	27
Texas ¹	5	5	20	18	1	5	57	98
Mountain States:								
Montana ¹	17	0	9	5	0	0	10	8
Idaho.....	5	1		1	0	1	0	3
Wyoming ¹	0	0	2	1	0	0	0	0
Colorado.....	0	0	13	7	0	2	4	4
New Mexico.....	0	0		4	0	0	12	8
Arizona.....	4	0	4	7	0	0	3	5
Utah ¹	0	0		1	1	0	1	2
Pacific States:								
Washington.....	45	0	15	5	2	1	2	3
Oregon.....	3	2	20	10	1	4	2	0
California.....	107	3	65	49	1	14	17	9
Total.....	299	249	885	1,022	15	63	956	1,032

¹ New York City only.

² Week ended earlier than Saturday.

³ Rocky Mountain spotted fever, week ended Aug. 11, 1934, 22 cases, as follows: Maryland, 8; District of Columbia, 2; Virginia, 7; North Carolina, 2; Montana, 1; Wyoming, 2.

⁴ Typhus fever, week ended Aug. 11, 1934, 40 cases, as follows: North Carolina, 2; Georgia, 4; Florida, 2; Alabama, 5; Louisiana, 1; Texas, 26.

⁵ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Menin- gococ- cus menin- gitis	Diph- theria	Infl- uenza	Ma- lar- ia	Meas- les	Pol- io- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
July 1934									
Arizona.....	1	4	8	1	65	1	10	9	18
Indiana.....		33	21	1	212		2	193	53
Maine.....	1	1	1		20	1	2	42	12
New Jersey.....	3	42	6	6	581		8	147	42
New Mexico.....	1	8	11	17	82	1	3	15	35
Pennsylvania.....	16	141		3	2,657	4	12	549	96
South Carolina.....		25	192	987	105	173	3	7	137
Vermont.....		1			66		3	24	1

July 1934

Anthrax:	Cases	Dengue:	Cases	Hookworm disease:	Cases
New Jersey.....	1	South Carolina.....	3	South Carolina.....	58
Pennsylvania.....	1	Diarrhea:		Lethargic encephalitis:	
Chicken pox:		South Carolina.....	868	Maine.....	1
Arizona.....	25	Dysentery:		New Jersey.....	2
Indiana.....	18	Arizona.....	9	Pennsylvania.....	15
Maine.....	84	Pennsylvania.....	2	South Carolina.....	3
New Jersey.....	243	German measles:		Mumps:	Cases
New Mexico.....	6	Arizona.....	13	Arizona.....	8
Pennsylvania.....	564	Maine.....	8	Indiana.....	5
South Carolina.....	13	New Jersey.....	134	Maine.....	10
Vermont.....	55	New Mexico.....	9	New Jersey.....	104
		Pennsylvania.....	75	New Mexico.....	8

July 1934—Continued

Mumps—Continued.	Cases	Rabies in man:	Cases	Undulant fever:	Cases
Pennsylvania.....	962	Pennsylvania.....	1	Arizona.....	1
South Carolina.....	49	Tetanus:		Indiana.....	1
Vermont.....	9	New Jersey.....	1	Maine.....	2
Ophthalmia neonatorum:		New Mexico.....	1	New Jersey.....	2
New Jersey.....	2	South Carolina.....	1	Pennsylvania.....	12
Pennsylvania.....	5	Trachoma:		Vermont.....	3
South Carolina.....	8	Arizona.....	42	Vincent's infection:	
Paratyphoid fever:		New Jersey.....	2	Maine.....	3
Maine.....	1	New Mexico.....	7	Whooping cough:	
New Mexico.....	3	Pennsylvania.....	3	Arizona.....	67
South Carolina.....	12	Trichinosis:		Indiana.....	225
Puerperal septicemia:		New Jersey.....	3	Maine.....	248
New Mexico.....	2	Tularaemia:		New Jersey.....	833
Rabies in animals:		Pennsylvania.....	1	New Mexico.....	71
Indiana.....	25	Typhus fever:		Pennsylvania.....	1,905
Maine.....	2	Indiana.....	1	South Carolina.....	211
New Jersey.....	11	South Carolina.....	5	Vermont.....	82
South Carolina.....	21				

CASES OF VENEREAL DISEASES REPORTED FOR JUNE 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama ¹				
Arizona.....	84	.75	113	2.49
Arkansas.....	436	2.33	264	1.41
California ¹	903	1.49	713	1.18
Colorado ¹				
Connecticut ¹	183	1.11	189	1.16
Delaware.....	95	3.04	34	1.41
District of Columbia.....	139	2.81	170	3.43
Florida.....	412	2.05	65	.42
Georgia.....	613	2.11	382	1.31
Idaho.....	0		0	
Illinois.....	1,527	1.95	1,079	1.38
Indiana.....	148	.45	113	.34
Iowa.....	121	.49	161	.65
Kansas.....	80	.42	50	.26
Kentucky.....	201	.76	369	1.39
Louisiana.....	218	1.01	107	.50
Maine.....	47	.59	44	.55
Maryland.....	635	3.82	228	1.37
Massachusetts.....	426	.99	506	1.31
Michigan.....	483	.96	415	.82
Minnesota.....	312	1.20	314	1.21
Mississippi.....	1,031	5.04	1,712	8.36
Missouri.....	284	.77	175	.48
Montana.....	65	1.21	50	.93
Nebraska.....	33	.24	53	.60
Nevada ¹				
New Hampshire.....	11	.28	12	.26
New Jersey.....	646	1.54	325	.78
New Mexico.....	21	.48	21	.48
New York.....	4,784	3.69	1,346	1.04
North Carolina ¹	479	1.46	145	.44
North Dakota ¹				
Ohio ¹	585	.86	267	.39
Oklahoma ¹	163	.78	124	.60
Oregon.....	55	.56	35	.36
Pennsylvania.....	292	.80	244	.25
Rhode Island.....	71	1.01	33	.47
South Carolina ¹	292	1.67	374	2.14
South Dakota ¹				
Tennessee.....	1,165	4.37	622	2.33
Texas.....	831	1.38	170	.28
Utah ¹				
Vermont.....	21	.58	17	.47

See footnotes at end of table.

Cases of venereal diseases reported for June 1934—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Virginia.....	441	1.81	333	1.36
Washington.....	182	1.14	254	1.59
West Virginia.....	200	1.13	111	.63
Wisconsin ¹	24	.08	130	.43
Wyoming ²				
Total.....	18,689	1.87	11,959	1.00

¹ Has been reporting regularly but no report received for the current month.² Incomplete.³ Not reporting.⁴ Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 4, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland.....	0		0	1	1	1	0	0	2	2	18
New Hampshire:											
Concord.....	0		0	0	0	0	0	0	0	0	4
Manchester.....	0		0	0	0	0	0	0	0	0	14
Nashua.....	0			0		0			0	0	
Vermont:											
Barre.....	0		0	0	0	0	0	0	0	0	1
Burlington.....	1		0	1	0	2	0	0	0	0	8
Massachusetts:											
Boston.....	1		0	7	5	8	0	0	1	40	163
Fall River.....	0		0	1	2	0	0	3	0	0	20
Springfield.....	0		0	2	0	1	0	0	1	1	23
Worcester.....	0		0	0	2	5	0	2	0	0	
Rhode Island:											
Pawtucket.....	0		0	0	0	0	0	0	0	0	11
Providence.....	0		0	4	0	1	0	2	0	37	38
Connecticut:											
Bridgeport.....	0	1	0	0	1	0	0	2	0	4	23
Hartford.....	0		0	13	0	1	0	1	1	0	41
New Haven.....	0		0	0	0	0	0	0	2	1	38
New York:											
Buffalo.....	1		0	3	5	10	0	3	0	25	118
New York.....	22	2	2	47	81	21	0	78	4	197	1,109
Rochester.....	0		0	1	2	5	0	2	1	4	59
Syracuse.....	0		0	14	1	2	0	1	0	50	43
New Jersey:											
Camden.....	2		0	1	0	1	0	0	0	6	21
Newark.....	0	1	0	5	5	2	0	11	0	51	87
Trenton.....	0		0	0	0	1	0	1	0	0	10
Pennsylvania:											
Philadelphia.....	3		0	8	13	18	0	27	7	174	308
Pittsburgh.....	4		1	12	11	10	0	5	1	15	119
Reading.....	0		0	0	0	0	0	0	0	29	23
Scranton.....	0			5		1	0		0	8	
Ohio:											
Cincinnati.....	0		0	0	8	3	0	4	1	6	106
Cleveland.....	2	14	0	36	9	8	0	12	2	51	153
Columbus.....	2		0	0	4	2	0	6	0	14	71
Toledo.....	0		0	0	1	3	0	4	1	20	39

City reports for week ended Aug. 4, 1934—Continued

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diph- theria cases	Influenza		Mea- sles cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Fort Wayne	2		0	0	1	1	0	1	3	0	43
Indianapolis	0		0	2	0	1	0	3	1	12	
South Bend	0		0	3	1	1	0	1	0	0	14
Terre Haute	0		0	0	0	0	0	0	0	0	18
Illinois:											
Chicago	1	1	4	55	20	31	0	41	5	98	685
Springfield	0		0	0	2	0	0	1	0	15	16
Michigan:											
Detroit	3	1	0	9	8	12	0	16	2	135	206
Flint	0		0	0	0	2	0	2	0	13	16
Grand Rapids	0		0	1	2	4	0	0	1	2	27
Wisconsin:											
Kenosha	0		0	5	0	0	0	0	0	0	12
Milwaukee	0		0	53	1	25	0	3	0	41	96
Racine	0		0	2	0	0	0	0	0	22	11
Superior	0		0	1	0	2	0	0	0	1	2
Minnesota:											
Duluth	0		0	8	0	0	0	0	0	1	11
Minneapolis	1		0	2	1	2	0	1	1	0	70
St. Paul	0		0	2	2	0	0	0	0	23	47
Iowa:											
Davenport	0			0		0	0		0	0	
Des Moines	0			0		1	0		0	0	23
Sioux City	0			0		0	0		0	2	
Waterloo	0			0		0	0		5	5	
Missouri:											
Kansas City	0		0	1	3	2	0	3	0	2	107
St. Joseph	1		0	0	3	0	0	0	0	1	25
St. Louis											
North Dakota:											
Fargo	0		0	1	0	0	0	0	0	22	8
Grand Forks	0			0		0	0		0	0	
South Dakota:											
Aberdeen	0			0		1	0		0	5	
Sioux Falls	0			0		0	0		0	0	8
Nebraska:											
Omaha	0		1	0	5	2	0	1	0	5	43
Kansas:											
Topeka	0		0	0	4	4	0	0	1	15	20
Wichita	0		0	1	0	1	0	0	0	3	20
Delaware:											
Wilmington											
Maryland:											
Baltimore	0		0	6	9	2	0	10	2	102	18
Cumberland	0		0	1	0	0	0	0	0	0	16
Frederick	0		0	0	0	0	0	0	0	0	0
District of Columbia:											
Washington	3		0	3	5	3	0	14	2	21	140
Virginia:											
Lynchburg	0		0	5	0	0	0	0	0	7	14
Norfolk	0		0	0	1	0	0	0	0	0	42
Richmond	0		0	5	4	1	0	3	2	0	45
Roanoke	0		0	0	0	0	0	0	0	9	13
West Virginia:											
Charleston	0		0	0	0	0	0	0	0	3	8
Huntington	1		0	0		2	0		1	2	
Wheeling	0		0	1	1	4	0	0	0	8	
North Carolina:											
Raleigh	0		0	0	0	0	0	1	0	3	17
Wilmington	1		0	0	1	0	1	0	0	7	9
Winston-Salem	2	2	0	0	0	0	0	1	14	10	13
South Carolina:											
Charleston	0	3	0	0	3	0	0	1	1	0	25
Columbia	0		0	0	0	0	0	2	0	0	31
Greenville	0			1		0	0		0	4	
Georgia:											
Atlanta	1	4	0	0	1	3	0	4	5	3	67
Brunswick	0		0	0	0	0	0	0	0	0	
Savannah	0		0	0	2	0	0	1	2	0	30

¹ Nonresident.

City reports for week ended Aug. 4, 1934—Continued

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diph- theria cases	Influenza		Mea- sles cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Florida:											
Miami.....	0		0	1	1	0	0	1	1	0	18
Tampa.....	1		0	4	1	1	0	1	0	0	18
Kentucky:											
Ashland.....	1			0	0	0	0		0	0	
Lexington.....	0		0	0	0	1	0	2	1	0	18
Louisville.....	5		0	16	1	0	0	1	4	11	70
Tennessee:											
Memphis.....	0		0	0	7	0	0	5	0	17	96
Nashville.....	0		0	0	3	0	0	3	5	7	46
Alabama:											
Birmingham.....	1		0	0	3	1	0	7	5	5	70
Mobile.....	0		0	0	2	0	0	1	1	2	24
Montgomery.....	2			2		0	0		0	1	
Arkansas:											
Fort Smith.....											
Little Rock.....	0		0	0	2	0	0	3	0	1	5
Louisiana:											
New Orleans.....	3	2	2	2	5	6	0	9	4	0	139
Shreveport.....	0		0	0	3	0	0	3	0	2	32
Oklahoma:											
Oklahoma City.....	1	4	0	1	0	1	0	2	0	0	38
Texas:											
Dallas.....	5		0		6	0	0	6	1	4	71
Fort Worth.....	1		0	0		0	0	2	0	0	34
Galveston.....	0		0	0	3	1	0	1	0	0	17
Houston.....	0		0	0	1	0	0	3	0	0	52
San Antonio.....	0		0	0	1	0	0	5	4	0	50
Montana:											
Billings.....	0		0	0	0	0	0	0	0	0	7
Great Falls.....	0		0	1	0	0	0	1	0	0	7
Helena.....	0		0	0	0	0	0	0	0	0	5
Missoula.....	0		0	0	0	0	0	0	0	0	6
Idaho:											
Boise.....	0		0	0	0	0	0	0	0	0	7
Colorado:											
Denver.....	3	23	0	28	2	11	0	4	2	18	66
Pueblo.....	2		0	1	1	1	0	1	0	6	6
New Mexico:											
Albuquerque.....	0		0	2	0	1	0	1	0	0	9
Utah:											
Salt Lake City.....	0		0	3	1	2	0	0	1	69	30
Nevada:											
Reno.....	0		0	0	0	0	0	0	0	0	4
Washington:											
Seattle.....	0		0	1	1	5	3	4	0	27	64
Spokane.....	0		0	3	3	0	0	0	0	13	26
Tacoma.....	0		0	0	2	0	0	0	0	0	23
Oregon:											
Portland.....	0		0	1	1	9	0	2	0	9	65
Salem.....	0	1		0		0	0		0	1	
California:											
Los Angeles.....	13	2	0	12	15	15	0	21	1	23	293
Sacramento.....	1		0	1	0	3	0	3	0	2	20
San Francisco.....	0	8	0	22	5	3	0	7	0	10	101

City reports for week ended Aug. 4, 1934—Continued

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable disease listed in the table. Weekly reports are received from about 700 cities from which the data are tabulated and filed for reference]

State and city	Meningococcus meningitis		Polio- mye- litis cases	State and city	Meningococcus meningitis		Polio- mye- litis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				District of Columbia:			
Boston.....	0	0	1	Washington.....	0	1	1
Connecticut:				Virginia:			
Hartford.....	0	0	1	Richmond.....	0	1	0
New York:				West Virginia:			
New York.....	2	0	2	Wheeling.....	0	0	1
New Jersey:				Georgia:			
Camden.....	0	0	2	Atlanta.....	1	1	0
Pennsylvania:				Brunswick.....	0	0	1
Philadelphia.....	0	0	2	Tennessee:			
Pittsburgh.....	0	0	1	Memphis.....	0	0	1
Ohio:				Nashville.....	0	0	1
Cincinnati.....	1	1	0	Alabama:			
Cleveland.....	1	1	2	Birmingham.....	0	0	1
Illinois:				Texas:			
Chicago.....	9	2	5	San Antonio.....	0	0	2
Michigan:				Montana:			
Detroit.....	0	0	2	Great Falls.....	0	0	1
Grand Rapids.....	0	0	1	Helena.....	0	0	2
Wisconsin:				Colorado:			
Milwaukee.....	0	0	2	Denver.....	1	0	1
Minnesota:				Utah:			
Duluth.....	0	0	1	Salt Lake City.....	0	0	1
Minneapolis.....	0	0	1	Washington:			
Iowa:				Spokane.....	0	0	23
Des Moines.....	0	0	1	California:			
Missouri:				Los Angeles.....	0	0	43
St. Joseph.....	1	0	0	San Francisco.....	1	0	2
Nebraska:							
Omaha.....	0	1	0				

¹Nonresident.

Dengue.—An estimation was made on August 10, 1934, of 3,300 cases of dengue, mild in character, at Miami, Fla.

Lethargic encephalitis.—Baltimore, Md., 1 case.

Pellagra.—Cases: Philadelphia, 2; Charleston, S.C., 1; Louisville, 2; Memphis, 1; Montgomery, 1; New Orleans, 1; Albuquerque, 1.

Typhus fever.—Cases: Baltimore, 1; Savannah, 4; Tampa, 1; Montgomery, 1.

FOREIGN AND INSULAR

BRITISH WEST INDIES

Barbados—Vital statistics—1933.—The following are vital statistics for Barbados, British West Indies, for 1933:

Population.....	180,055	Number of deaths.....	3,593
Number of marriages.....	1,063	Deaths per 1,000 population.....	20.13
Number of births.....	5,316	Deaths under 1 year of age.....	1,248
Births per 1,000 population.....	29.79	Deaths under 1 year of age per 1,000 births.....	235

CANADA

Provinces—Communicable diseases—2 weeks ended July 28, 1934.—During the 2 weeks ended July 28, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Ed- ward Island	Nova Sco- tia	New Brun- swick	Que- bec	Onta- rio	Mani- toba	Sas- katch- ewan	Alber- ta	British Colum- bia	Total
Cerebrospinal meningitis.....				1	2	1				4
Chicken pox.....		13		44	208	62	36	14	20	397
Diphtheria.....		2	1	40	5	12	11			71
Erysipelas.....				1	3	2	1	1	1	9
Influenza.....		4			7				2	13
Lethargic encephalitis.....						1				1
Measles.....		8	3	295	80	87		1	4	530
Mumps.....		1			84		5		44	134
Paratyphoid fever.....		1			5					6
Pneumonia.....		2			4				3	9
Poliomyelitis.....	1			2	2				1	6
Scarlet fever.....		14	3	80	88	48	16	7	52	308
Trachoma.....									21	21
Tuberculosis.....	8	1	7	149	39	9	26	2	32	273
Typhoid fever.....	1		2	41	19	1	8	6	2	81
Undulant fever.....				2	2					4
Whooping cough.....		12		356	220	6	42	11	14	661

CUBA

Habana—Poliomyelitis.—During the 2 weeks ended July 21, 1934, 26 cases of poliomyelitis, including imported cases, with 1 death were reported in Habana, Cuba.

ITALY

Communicable diseases—4 weeks ended February 4, 1934.—During the 4 weeks ended February 4, 1934, cases of certain communicable diseases were reported in Italy, as follows:

(1008)

Disease	Jan. 8-14		Jan. 15-21		Jan. 22-28		Jan. 29-Feb. 4	
	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected
Anthrax	24	21	18	18	9	9	10	10
Cerebrospinal meningitis	3	3	13	12	15	13	21	18
Chicken pox	297	115	241	82	273	117	285	97
Diphtheria and croup	611	327	638	374	656	377	599	326
Dysentery	4	4	2	2	2	2	3	1
Lethargic encephalitis	3	3	1	1	2	2	2	2
Measles	1,296	208	1,442	235	1,827	269	1,800	251
Polio-myelitis	4	4	6	5	7	7	5	5
Scarlet fever	279	111	282	128	253	122	305	134
Typhoid fever	275	157	207	142	222	151	193	142

PUERTO RICO

Influenza.—A report dated August 15, 1934, states that there were approximately 3,500 cases of influenza in Puerto Rico. The principal foci were San Juan, Gurabo, Humacao, and Caguas. The disease was said to be mild.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 27, 1934, pp. 890-903. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Aug. 31, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China—Shanghai.—During the week ended July 28, 1934, 2 cases of cholera were reported in Shanghai, China.

Plague

Argentina.—During the month of July 1934 plague was reported in Argentina as follows: 1 case in Chamental, Jujuy Province, and 1 case in Santa Fe.

China—Manchuria.—A report dated August 2, 1934, states that 8 deaths from plague have occurred in a village near Nungan, Manchuria, China.

Indo-China—Bentre.—On August 5, 1934, 1 case of plague occurred in Bentre, Indo-China.

Typhus fever

Syria—Beirut.—During the week ended August 4, 1934, 1 case of typhus fever was reported in Beirut, Syria.

Yellow fever

Brazil.—During the month of May 1934, yellow fever was reported in Brazil, as follows: May 30, 1 case and 1 death at Victoria Bank, Bahia State; May 14, 1 case and 1 death, May 28, 1 case and 1 death at Carius, Ceara State; May 22, 1 case and 1 death at St. Sebastian, Para State.